

CLAIMS

1. A 3-D image display unit for displaying a 3-D image configured by a plurality of images, including:
 - an input part for inputting control information required to display said 3-D image;
 - wherein said control information includes information that denotes the 3-D intensity of said 3-D image.
2. The 3-D image display unit according to claim 1;
 - wherein said unit further includes a calculation part and a display control part;
 - wherein said calculation part calculates an accumulative intensity value that increases together with a time according to said 3-D intensity while said display control part, when said accumulative intensity is over a first threshold value, makes a predetermined display operation.
3. The 3-D image display unit according to claim 2;
 - wherein said display operation includes display of a warning message.
4. The 3-D image display unit according to claim 2;
 - wherein said display operation includes a parallax adjustment for said 3-D image so as to be reduced.
5. The 3-D image display unit according to claim 2;
 - wherein said display operation includes forming of a 2-D image from said 3-D image to display said 2-D image instead of said 3-D image.
6. The 3-D image display unit according to claim 5;
 - wherein said display operation includes resuming display of said 3-D image instead of said 2-D image in a predetermined time.
7. The 3-D image display unit according to claim 5;

wherein said calculation part calculates an accumulative intensity value that decreases together with a time during 2-D image display and said display operation, when said accumulative intensity is under a second threshold value, includes resuming display of said 3-D image instead of said 2-D image.

8. The 3-D image display unit according to any of claims 1 to 7;

wherein said unit further includes an input part for inputting an external signal that includes a request signal for switching display between 3-D image display and 2-D image display;

wherein said unit selects either of said 3-D image display or forming a 2-D image from said 3-D image to display said formed 2-D image instead of said 3-D image according to said request signal.

9. The 3-D image display unit according to any of claims 6 or 7;

wherein said unit further includes an input part for inputting an external signal that includes a request signal for switching display between 3-D image display and 2-D image display;

wherein said request signal is invalidated between when said 2-D image is displayed due to said display operation and when said resuming operation is made.

10. The 3-D image display unit according to any of claims 1 to 9;

wherein said first threshold value is included in said control information.

11. The 3-D image display unit according to claim 6;

wherein said predetermined time is included in said control information.

12. The 3-D image display unit according to claim 7;

wherein said second threshold value is included in said control information.

13. A 3-D image display unit for displaying a 3-D image configured by a plurality of images, including:

an input part for inputting control information required to display said 3-D image; and

a display control part for controlling display of said 3-D image;

wherein said display control part forms a 2-D image from said 3-D image according to a predetermined first condition, displays said formed 2-D image instead of said 3-D image, and displays said 3-D image instead of said 2-D image according to a predetermined second condition.

14. A 3-D image recording device for recording a 3-D image configured by a plurality of images in a predetermined recording region;

wherein said recording area includes at least one of an image recording region for recording said 3-D image, an audio recording region for recording audio data, and a sub-code recording region for recording associated information.

15. A 3-D image recording device for recording a 3-D image configured by a plurality of images;

wherein said device includes a recording part for recording control information required to control display of said 3-D image in a predetermined recording area;

wherein said control information includes information for denoting the 3-D intensity of said 3-D image;

wherein said recording area includes at least one of an image recording region for recording said 3-D image, an audio recording region for recording audio data, and a sub-code recording region for recording associated information.

16. A 3-D image recording device for recording a 3-D image configured by a plurality of images, including:

a recording part for recording control information required to control display of said 3-D image in a predetermined recording area;

wherein said control information includes a threshold value related to an accumulative value that increases together with a 3-D display time; and

wherein said recording area includes at least one of an image recording region for recording said 3-D image, an audio recording region for recording audio data, and a sub-code recording region for recording associated information.

17. A 3-D image recording device for recording a 3-D image configured by a plurality of images in a predetermined recording area, including:

a recording part for recording control information required to control display of said 3-D image;

wherein said control information includes information for denoting a limit time for limiting display of said 3-D image; and

wherein said recording area includes at least one of an image recording region for recording said 3-D image, an audio recording region for recording audio data, and a sub-code recording region for recording associated information.

18. A 3-D image recording method for recording a 3-D image configured by a plurality of images in a predetermined recording area;

wherein said recording area includes at least one of an image recording region for recording said 3-D image, an audio recording region for recording audio data, and a sub-code recording region for recording associated information.

19. A 3-D image recording method for recording a 3-D image configured by a plurality of images in a predetermined recording area, including;

a recording step of recording control information required to control display of said 3-D image in a predetermined recording area;

wherein said control information includes information for denoting the 3-D intensity of said 3-D image; and

wherein said recording area includes at least one of an image recording region for recording said 3-D image, an audio recording region for recording audio data, and a sub-code recording region for recording associated information.

20. A 3-D image recording method for recording a 3-D image configured by a plurality of images in a predetermined recording area, including:

a recording step of recording control information required to control display of said 3-D image in a predetermined recording area;

wherein said control information includes a threshold value related to an accumulative value that increases together with a 3-D image display time;

wherein said recording area includes at least one of an image recording region for recording said 3-D image, an audio recording region for recording audio data, and a sub-code recording region for recording associated information.

21. A 3-D image recording method for recording a 3-D image configured by a plurality of images in a predetermined recording area, including:

a recording step of recording control information required to control display of said 3-D image in a predetermined recording area;

wherein said control information includes information for denoting a limit time for limiting display of said 3-D image; and

wherein said recording area includes at least one of an image recording region for recording said 3-D image, an audio recording region for recording audio data, and a sub-code recording region for recording associated information.

22. A 3-D image display unit for displaying a right-eye image and a left-eye image of a user separately, including:

3-D image forming means for forming a 3-D image from a plurality of images; and

parallax adjusting means for adjusting the parallax of said 3-D image for said 3-D image forming means;

wherein said parallax adjusting means, when said 3-D image display time exceeds a first predetermined time, reduces the parallax of said 3-D image for said 3-D image forming means.

23. The 3-D image display unit according to claim 22, including:

storage means for storing the parallax of said 3-D image;

wherein said parallax adjusting means, in the case where said second predetermined time is reached after reducing the parallax of said 3-D image for said 3-D image forming means, restores the original parallax of said 3-D image for said 3-D image forming means according to the parallax stored in said storage means.

24. The 3-D image display unit according to claim 22;

wherein said unit further includes:

3-D image decoding means for decoding 3-D image format data; and

separating means for separating 3-D image data decoded by said 3-D image decoding means into right-eye image data and left-eye image data.

25. The 3-D image display unit according to claim 24;

wherein the format of said 3-D image format data includes at least a single piece of 3-D image identification information for denoting whether or not object data is used to display a 3-D image, at least a single piece of 3-D image display control information that includes at least one of a first predetermined time and a second predetermined time, and at least a single piece of image data.

26. The 3-D image display unit according to claim 25;

wherein said 3-D image decoding means includes 3-D image control information analyzing means for analyzing 3-D image control information included in said 3-D image format data and image data decoding means for decoding said 3-D image data included in said 3-D image format data.

27. A 3-D image display unit for displaying a right-eye image and a left-eye image of a user separately;

wherein said unit includes:

3-D image forming means for forming a 3-D image from a plurality of images; and

warning display controlling means for forming a warning display for said 3-D image forming means;

wherein said warning display controlling means, in the case where the display time of said 3-D image exceeds a first predetermined time, forms said warning display for said 3-D image forming means.

28. The 3-Dn image display unit according to claim 27;

wherein said warning display is made as a 3-D image.

29. The 3-Dn image display unit according to claim 27;

wherein said warning display is made as a 3-D image and other displays are made as 2-D images.

30. The 3-Dn image display unit according to claim 27 or 28;

wherein said warning display is made as a 3-D image that is displayed at a limiting place within which the user can recognize the image with difficulty.

31. The 3-Dn image display unit according to claim 27;

wherein said unit further includes:

3-D image decoding means for decoding 3-D image format data;

and

separating means for separating said 3-D image data decoded by said 3-D image decoding means into right-eye image data and left-eye image data.

32. The 3-D image display unit according to claim 31;

wherein the format of said 3-D image format data includes at least a single piece of 3-D image identification information for denoting whether or not object data is used to display a 3-D image, at least a single piece of control information that includes a first predetermined time, and at least a single piece of image data.

33. The 3-D image display unit according to claim 32;

wherein said 3-D image decoding means includes 3-D image control information analyzing means for analyzing 3-D image control information included in said 3-D image format data and image data decoding means for decoding said 3-D image data included in said 3-D image format data.

34. A 3-D image display unit for displaying a right-eye image and a left-eye image of a user separately;

wherein said unit includes:

3-D image forming means for forming a 3-D image from a plurality of images;

2-D image forming means for forming a 2-D image from said plurality of images; and

display means for displaying a 3-D image formed by said 3-D image forming means or 2nd image formed by said 2-D image forming means; and

wherein a power supply that includes at least the power of said display means is shut off automatically in the case where a 3-D image display time exceeds said first predetermined time; and

wherein said display means displays said 2-D image formed by said 2-D image forming means in the case where said shut-off power supply is restored before the 3-D image display off-time exceeds said second predetermined time after the power of said display means is shut off automatically.

35. The 3-D image display unit according to claim 34;

wherein said unit further includes 3-D image decoding means for decoding 3-D image format data and separating means for separating 3-D image data decoded by said 3-D image decoding means into right-eye image data and left-eye image data.

36. The 3-D image display unit according to claim 35;

wherein the format of said 3-D image format data includes at least a single piece of 3-D image identification information for denoting whether or not object data is used to display a 3-D image, at least a single piece of control information that includes at least one of a first predetermined time and a second predetermined time, and a single piece of image data.

37. The 3-D image display unit according to claim 36;

wherein said 3-D image decoding means includes 3-D image control information analyzing means for analyzing 3-D image control information included in said 3-D image format data and image data

decoding means for decoding said 3-D image data included in said 3-D image format data.

38. A 3-D image encoding device for encoding a 3-D image configured by a plurality of images, including:

encoding means for encoding said 3-D image;

generating means for generating control information required to control display of said 3-D image; and

multiplexing means for multiplexing encoded data obtained from said encoding means and control information obtained from said generating means;

wherein said control information includes information for denoting the 3-D intensity of said 3-D image.

39. A 3-D image encoding device for encoding a 3-D image configured by a plurality of images, including;

encoding means for encoding said 3-D image;

generating means for generating control information required to control display of said 3-D image;

multiplexing means for multiplexing encoded data obtained from said encoding means and control information obtained from said generating means;

wherein said control information includes a threshold value related to an accumulative value that increases together with a 3-D display time.

40. A 3-D image decoding device for decoding a 3-D image configured by a plurality of images, including;

demultiplexing means for separating encoded data of a 3-D image and control information required to control display of said 3-D image from input data;

decoding means for decoding said encoded data; and

analyzing means for analyzing said control information;

wherein said control information includes information for denoting the 3-D intensity of said 3-D image.

41. A 3-D image decoding device for decoding a 3-D image configured by a plurality of images, including;

demultiplexing means for separating encoded data of said 3-D image and said control information required to control display of said 3-D image from input data;

decoding means for decoding said encoded data; and

analyzing means for analyzing said control information;

wherein said control information includes a threshold value related to an accumulative value that increases together with a 3-D display time.

42. A 3-D image recording method for recording a 3-D image configured by a plurality of images, including;

a recording step of recording control information required to control display of said 3-D image;

wherein said control information includes information for denoting the 3-D intensity of said 3-D image.

43. A 3-D image recording method for recording a 3-D image configured by a plurality of images, including;

a recording step of recording control information required to control display of said 3-D image;

wherein said control information includes a threshold value related to an accumulative value that increases together with a 3-D display time.

44. A 3-D image transmitting method for transmitting a 3-D image configured by a plurality of images, including:

a step of transmitting control information required to control display of said 3-D image;

wherein said control information includes information for denoting the 3-D intensity of said 3-D image.

45. A 3-D image transmitting method for transmitting a 3-D image configured by a plurality of images, including:

a step of transmitting control information required to control display of said 3-D image;

wherein said control information includes a threshold value related to an accumulative value that increases together with a 3-D display time.

46. A 3-D image recording method for recording a 3-D image configured by a plurality of images, including:

a recording step of recording control information required to control display of said 3-D image;

wherein said control information includes display information that can take at least two values; and

wherein said display information denotes that said 3-D image is displayed in the case where said information takes a first value and said 3-D image is displayed as a 2-D image or 3-D image in the case where said information takes a second value.

47. The 3-D image recording method according to claim 46;

wherein said control information includes information for denoting which of said plurality of images is to be used for forming a display image in the case where a 3-D image is displayed as a 2-D image.

48. A 3-D image transmitting method for transmitting a 3-D image configured by a plurality of images, including:

a recording step of recording control information required to control display of said 3-D image;

wherein said control information includes information that can take at least two values; and

wherein said display information denotes that a 3-D image is displayed as a 2-D image in the case where said information takes a first value and a 3-D image is displayed as a 2-D image or 3-D image in the case where said information takes a second value.

49. The 3-D image transmitting method according to claim 48;

wherein said control information includes information for denoting which of said plurality of images is to be used to form a display image in the case where a 3-D image is displayed as a 2-D image.

50. A 3-D image display unit for displaying a 3-D image configured by a plurality of images, including:

an input part for inputting control information required to display said 3-D image;

wherein said control information includes display information that can take at least two values; and

wherein said display information denotes that a 3-D image is displayed as a 2-D image in the case where said information takes a first value and a 3-D image is displayed as a 2-D image or 3-D image in the case where said information takes a second value.

51. The 3-D image display unit according to claim 50;

wherein said control information includes information for denoting which of said plurality of images is to be used to form a display image in the case where said 3-D image is displayed as a 2-D image.

52. A 3-D image recording method for recording a 3-D image configured by a plurality of images, including:

- a recording step of recording control information required to control display of said 3-D image;

- wherein said control information includes a threshold value related to an accumulative value that increases together with a 3-D display time;

- wherein said threshold value, when it is a predetermined value, denotes that a 3-D image is displayed as a 2-D image; and

- wherein said threshold value, when it is not said predetermined value, denotes that a 3-D image is displayed as either a 2-D image or 3-D image.

53. A 3-D image recording method for recording a 3-D image configured by a plurality of images, including:

- a recording step of recording control information required to control display of said 3-D image;

- wherein said control information includes a threshold value required to control 3-D image display;

- wherein said threshold value, when it is a predetermined value, denotes that a 3-D image is displayed as a 2-D image; and

- wherein said threshold value, when it is not said predetermined value, denotes that a 3-D image is displayed as either a 2-D image or 3-D image.

54. The 3-D image recording method according to claim 52 or 53;

- wherein said predetermined value is 0.

55. A 3-D image transmitting method for transmitting a 3-D image configured by a plurality of images, including:

- a recording step of recording control information required to control display of said 3-D image;

wherein said control information includes a threshold value related to an accumulative value that increases together with a 3-D display time;

wherein said threshold value, when it is a predetermined value, denotes that a 3-D image is displayed as a 2-D image; and

wherein said threshold value, when it is not said predetermined value, denotes that a 3-D image is displayed as either a 2-D image or 3-D image.

56. A 3-D image transmitting method for transmitting a 3-D image configured by a plurality of images, including:

a recording step of recording control information required to control display of said 3-D image;

wherein said control information includes a threshold value required to control display of said 3-D image;

wherein said threshold value, when it is a predetermined value, denotes that a 3-D image is displayed as a 2-D image; and

wherein said threshold value, when it is not said predetermined value, denotes that a 3-D image is displayed as either a 2-D image or 3-D image.

57. The 3-D image transmitting method according to claim 55 or 56;

wherein said predetermined value is 0.

58. A 3-D image display unit for displaying a 3-D image configured by a plurality of images, including:

an input part for inputting control information required to display said 3-D image;

wherein said control information includes a threshold value related to an accumulative value that increases together with a 3-D display time;

wherein said threshold value, when it is a predetermined value, denotes that a 3-D image is displayed as a 2-D image; and

wherein said threshold value, when it is not said predetermined value, denotes that a 3-D image is displayed as either a 2-D image or 3-D image.

59. A 3-D image display unit for displaying a 3-D image configured by a plurality of images, including:

an input part for inputting control information required to display said 3-D image;

wherein said control information includes a threshold value required to control 3-D image display;

wherein said threshold value, when it is a predetermined value, denotes that a 3-D image is displayed as a 2-D image; and

wherein said threshold value, when it is not said predetermined value, denotes that a 3-D image is displayed as either a 2-D image or 3-D image.

60. The 3-D image display unit according to claim 58 or 59;

wherein said predetermined value is 0.